

Volume Measurement in Greiner Bio-One 651201 96-Well V-Bottom Polypropylene Microplates Using the Scarlett™ 01 Volume Analysis System

Summary

The Scarlett™ 01 Volume Analysis System successfully measured liquid volumes in Greiner Bio-One 651201 96-well V-bottom microplates across multiple liquid types and dispense volumes. Measurements demonstrated strong agreement with calibrated reference volumes throughout the evaluated quantitative range. In addition, Scarlett 01 successfully distinguished empty wells from wells containing 3 µL of liquid, demonstrating low-volume liquid detection well below the quantitative measurement range.

Key Results

- Scarlett successfully measured liquid volumes in **Greiner Bio-One 651201** 96-well V-bottom polypropylene microplates.
- Quantitative volume measurement demonstrated across test conditions spanning approximately **60–300 µL**.
- Successful liquid detection down to **3 µL**
- Liquids evaluated:
 - **DI H₂O**
 - **DMSO (≥99.9%)**
- Quantitative measurements demonstrated good agreement with calibrated syringe reference volumes across the tested volume range.

Performance Overview

Table 1. Test Summary

Parameter	Value
Plate Manufacturer / Model	Greiner Bio-One 651201
Plate Type	96-Well, Round-well, V-bottom, Polypropylene
Quantitative Range Evaluated	DI H ₂ O: 70–300 µL, DMSO: 60-100 µL
Low-Volume Detection Evaluated	DI H ₂ O: down to 3 µL
Liquids Evaluated	2
Maximum Inaccuracy	≤±2.7%
Maximum CV	1.8%

Verification Results

Across the evaluated quantitative test conditions, volumes measured by the Scarlett 01 System closely matched calibrated reference volumes. Inaccuracy values remained below ± 2.71%, while coefficient of variation (CV) values remained below 1.84%, demonstrating accurate and precise volume measurements throughout the quantitative test range.

Table 2. Measurement Performance Results

Liquid	Target Volume (μL)	n	Mean Volume (μL)	^a Inaccuracy	CV
DI H ₂ O	70.06	6	70.04	-0.04%	0.78%
	80.20	6	81.27	1.34%	1.19%
	90.32	6	91.78	1.62%	1.84%
	99.56	6	96.96	-2.61%	1.23%
	199.12	6	201.84	1.37%	0.45%
	298.68	6	295.95	-0.91%	0.21%
DMSO	59.94	6	61.57	2.71%	0.88%
	80.20	6	81.81	2.01%	0.43%
	99.56	6	100.3	0.74%	0.80%

a – Inaccuracy (%) is calculated relative to calibrated syringe reference volumes

Measurement Method

Measurements were performed using plate- and liquid-specific calibration curves. Calibration curves were generated using reference volumes dispensed by Hamilton glass syringes calibrated by RISE (Research Institutes of Sweden) according to ISO 8655 procedures. Reported inaccuracy values are relative to calibrated reference volumes.

Qualitative Volume Check Results

Scarlett 01 possesses the ability to detect liquid volumes well below the recommended quantitative operating range for this V-bottom microplate. In this mode, the system is used as a qualitative measurement tool to determine the presence or absence of liquid within a well, rather than to precisely quantify liquid volume. As demonstrated in the results below, the Scarlett 01 system reliably differentiates between filled and empty wells, including low dispense volumes of 3 μL.

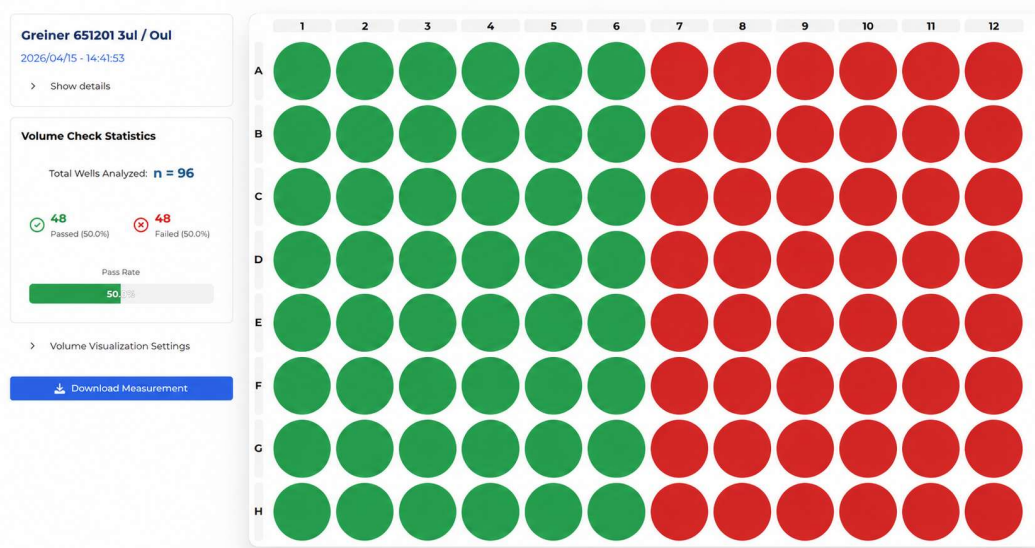


Figure 1. Volume check functionality of the Scarlett 01 Volume Analysis System for a **Greiner 651201** microtiter plate with 48 **empty** wells (red) and 48 wells **filled** with 3μL of DI water (green).

Conclusion

The Scarlett 01 Volume Analysis System demonstrated accurate and precise liquid volume measurements in the Greiner 651201 microplate across the evaluated DI H₂O and DMSO test conditions, spanning approximately 60–300 µL. Scarlett 01 also successfully distinguished empty wells from wells containing 3 µL of DI H₂O, demonstrating low-volume liquid detection below the quantitative measurement range.

Greiner 651201 96-Well Plate – V-Bottom, Chimney Well

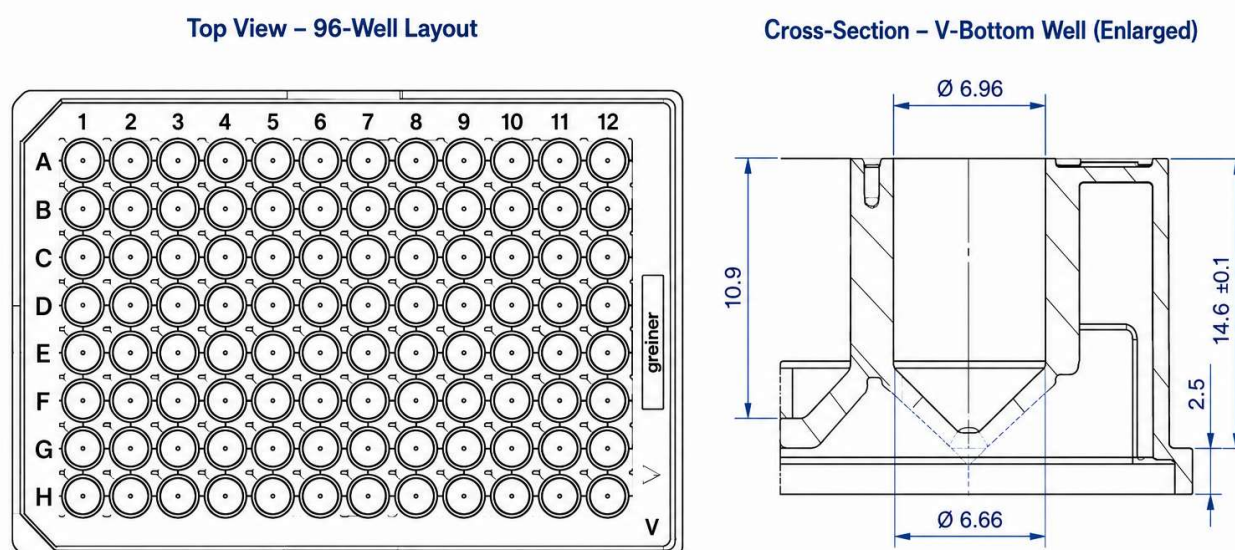


Figure 2. The V-bottom geometry of the Greiner 651201 microtiter plate.

Ready to see Scarlett measure volumes in your plate? Contact Aventix hello@aventix.io to discuss your application, microplate format, and liquid handling requirements.